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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,784	10/17/2003	Gaurav Singh	RZMI-P0310-US	9860
02889	7590	05/11/2011		
Vista IP Law Group LLP 1885 Lundy Avenue Suite 108 San Jose, CA 95131			EXAMINER ANDREWS, LEON T	
			ART UNIT	PAPER NUMBER
			2462	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/687,784

**Applicant(s)**

SINGH ET AL.

**Examiner**

LEON ANDREWS

**Art Unit**

2462

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 April 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4,6-9,21,23-25,27,28 and 30-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6-9,27,28 and 30 is/are rejected.
- 7) ☒ Claim(s) 21,23-25 and 31-32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***RCE***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 19, 2011 has been entered.

***Claim Objections***

2. **Claims 2, 4, 6-9, 23-24 and 27-28** are objected to because of the following informalities:

**Claim 2, 4, 6-9, 23-24 and 27-28, line 1** recited "packet duplication system". Should be – multicast packet duplication system -- as recited in the independent claims.

Appropriate correction is required.

3. **Claims 1-2, 4, 6-9, 27-28 and 30** are being rejected under 35 U.S.C. 103(a) as being unpatentable by Wong (Pub. No.: 2004/0264464 A1 using Provisional application No.: 60/482,759) in view of Tang et al. (Patent No.: US 6,553,028 B1), Fig. 1 of the Admitted Prior Art (hereinafter APA) in the Background of the application (Pub. No.: US 2005/0083839 A1) and Herriot (Patent Number: 5,929,792).

**Regarding Claim 1 (as best understood)**, Wong discloses a multicast packet duplication system for multicast packets (Internet Protocol Multicast (IPMC) packet duplication covers tables required to implement the MMU and egress module, page 3, lines 2-4) containing at least multicast address data (multicast packet is replaced with source MAC address, page 3, lines 14-15), comprising:

an input port (Block Diagram, CPI ingress bus, page STN-2) configured to receive a packet (IPMC packet, page 5, line 21);

a pointer table (IMPC\_PTR, page 5, line 21) (ECMP Support, LPM table, page STN-7) having a width comprising a plurality of entries (ECMP Support, LPM table, page STN-7; ECMP Dest\_Ip, steps 2 and 3, LPM table with ip addresses, page STN-8) coupled to a linked-list table (replicate table based on the IMPC\_PTR writes the replicate, page 5, lines 21-22) (ECMP Support, L3 table, page STN-7; steps 6 and 7, L3\_table\_index, index points to entry of 8 entries in the L3 table); and

a plurality of output ports configured to output the packet (each egress port with packet replication done by the memory where the data is sent to egress port when ready with the entry being released, page 5, lines 20-26), wherein

a number of duplications of the packet for each of at least some of the plurality of output ports is controlled by descriptors arranged in a linked-list table (replicate table keeps track of the number of copies that the packet has been duplicated per port based on the IMPC\_PTR to the index, page 5, lines 4-10, 21-32) and is duplicated on a per port basis by transmitting the packet to at least some of the plurality of output ports that are specified in at least some of the descriptors for duplication rather than by transmitting the packet, which has been received at the input port, to

all the plurality of output ports, in which the multicast packet duplication system is configured for improving a size of memory utilized by the multicast packet duplication system by using at least some of the descriptors rather than by expanding physical memory to cover all possible duplication requests (replicate table keeps track of the number of copies that the packet has been duplicated per port based on the IPMC\_PTR to the index, and each egress port with packet replication done by the memory where the data is sent to egress port when ready the entry being released with the memory keeping track of the number of copies the packet has been duplicated, page 5, lines 4-10, 20-32), at least one of the descriptors is shared among multiple output ports of the plurality of output ports, and an encoding format for the descriptors include at least one of: a contiguous range encoding that includes a starting indicator and an ending indicator for a first set of the descriptors within the contiguous range; a non-contiguous range encoding that includes information or data of a most significant bit (MSB) portion of an indicator; and a discrete encoding that includes a first indicator and a second indicator.-

Wong fails to disclose plurality of output ports wherein duplications of the packet for the output ports controlled by descriptors in the table rather than the packet received at the input port, one or more descriptor shared among the output ports, encoding range that includes a starting indicator and an ending indicator for one or more descriptors and encoding that includes first and second indicators.

But, Tang et al. discloses replication using table pointer and index whereby the index enables the performance of the multicast packet replication at ports other than ingress, and the

pointer locating the entry in the table for each outgoing VLAN and the index used for selecting the ports of the egress VLAN that should receive the frame, column 14, lines 4-14, 25-31, for each outgoing VLAN, the pointer locates the entry in the table and the index selects the ports of the egress VLAN, column 14, lines 25-31, replication starting from the location referenced by the pointer (start indicator) until it reaches an entry having a control bit (end indicator) that specifies the termination of the replication, column 14, lines 39-42 and replication starting from the location referenced by the pointer (first indicator) until it reaches an entry having a control bit (second indicator) that specifies the termination of the replication, column 14, lines 37-42.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s limitation because this would have allowed the pointer and the index to perform the replication operation, and replication process to continue for each outgoing VLAN, column 14, lines 5-6, 37-38.

The combination of Wong and Tang et al. fails to disclose duplications on a per port basis on at least one of the output ports rather than all of the output ports.

But, Fig. 1 of the APA discloses duplication where copy of the packet is sent to a different VLAN and port, ¶ [0003], lines 11-14.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the Fig. 1, of the APA's limitation because this would have allowed duplication whereby copy is sent to a port rather than multiple copies sent to each port, ¶ [0003], lines 11-15.

And, the combination of Wong, Tang et al. and Fig.1 of the APA fails to disclose encoding range that includes a most significant bit (MSB) of an indicator.

But, Herriot discloses most significant bit of the encoded character is masked to a range where an indicator corresponds to a range of the character, columns 11-12, lines 64-65, 4-5.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Herriot's limitation because this would have allowed the most significant bit of the encoded character where the indicator corresponds to the range of the character, columns 11-12, lines 64-65, 4-5.

**Regarding Claims 2,** Wong discloses the packet duplication system, wherein each of the number of duplications is coupled to a Virtual Local Area Network (VLAN) (IPM packet replication per VLAN, page STN-10, line 8).

**Regarding Claims 4,** Wong discloses the packet duplication system, wherein the VLAN pointer descriptors arranged in the linked-list table include at least one shared descriptor (IPMC\_PTR is the index in the IP multicast group vector table is also the index in the IP multicast VLAN ID table, Replication Flow, page STN-48, lines 1-3).

**Regarding Claim 6,** Wong discloses the packet duplication system of claim 5, wherein each of the plurality of entries (column of 8 entries in the L3 table, ECMP Dest\_Ip Search, step 7, page STN-8) corresponds to one of the plurality of output ports (Block Diagram, CPE egress bus, page STN-2).

**Regarding Claims 7**, Wong discloses the packet duplication system, wherein the contiguous range encoding includes a starting Virtual Local Area Network (VLAN) indicator (IPMC Replication, VLAN\_ID1, step 9, page STN-13) and an ending VLAN indicator (IPMC Replication, VLAN\_ID2, step 12, page STN-13).

**Regarding Claims 8**, Wong discloses the packet duplication system, wherein the non-contiguous range encoding includes a most significant bit (MSB) portion (IPMC Replication, 64-bit vector for specifying the MS (Most Significant) 6 bits of VLAN\_ID, page STN-11, lines 11-12) of a Virtual Local Area Network (VLAN) indicator (IPMC Replication, VLAN\_ID, page STN-11) and a bitmap (ECMP Dest\_Ip Search, step 7, LPM table get 12-bit L3\_table\_index with 3-bit count field, page STN-8) decoded from a least significant bit (LSB) portion (ECMP Dest\_Ip Search, step 8, index points to the first entry of column of 8-entries in the L3 table, page STN-8) of the VLAN indicator.

**Regarding Claims 9**, Wong discloses the packet duplication system, wherein the discrete encoding includes a first Virtual Local Area Network (VLAN) indicator (IPMC Replication, VLAN\_ID1, step 9, page STN-13) and a second VLAN indicator (IPMC Replication, VLAN\_ID2, step 12, page STN-13).



**Regarding Claim 27**, Wong discloses the packet duplication system of claim 1, wherein a first descriptor in the linked-list table includes a first link to a second descriptor in the linked-list table.

The combination of Wong, Fig.1 of the APA and Herriot fails to disclose first descriptor to second descriptor in the table.

But, Tang et al. discloses Fig. 3, the port index becomes the destination index in the table, column 9, lines 64-65.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s limitation because this would have allowed the port index to become the destination index when there was a hit in the table which responds to the select signals over the switching bus, columns 9 and 10, lines 64-67 and line 1 respectively.

**Regarding Claim 28**, Wong discloses the packet duplication system of claim 27, wherein the second descriptor in the linked-list table includes a second link to a third descriptor in the linked-list table.

The combination of Wong, Fig.1 of the APA and Herriot fails to disclose second descriptor to third descriptor in the table.

But, Tang et al. discloses Fig. 3, the destination index is then used to reference an index entry 352 in the table, column 9, lines 65-66.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Tang et al.'s limitation because this would have allowed the

destination index to reference the index entry when there was a hit in the table which responds to the select signals over the switching bus, columns 9 and 10, lines 64-67 and line 1 respectively.

**Regarding Claim 30**, Wong discloses the multicast packet duplication system, wherein some of the descriptors are configured or programmed for:

a first output port of the plurality of output ports that receives a first number of duplications of the packet; and

a second output port of the plurality of output ports that receives a second number of duplications of the packet, in which the first number is different from the second number.

The combination of Wong and Tang et al. and Herriot fails to specifically disclose a first output port of the plurality of output ports that receives a first number of duplications, and a second output port of the plurality of output ports that receives a second number of duplications of the packet, in which the first number is different from the second number.

But, Fig. 1 of the Admitted Prior Art in the Background of the application discloses a first output port (port 0) of the plurality of output ports (ports 0 - N) that receives a first number of duplications (Vlan2, Vlan8, Vlan9 (3 duplicates)), and a second output port (port N) of the plurality of output ports (ports 0 - N) that receives a second number of duplications (Vlan4, Vlan7 (2 duplicates)) of the packet, in which the first number (Vlan2, Vlan8, Vlan9 (3 duplicates)) is different from the second number (Vlan4, Vlan7 (2 duplicates)).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the Fig. 1, of the APA's limitation because this would have allowed duplication whereby copy is sent to a different Vlan and port, ¶ [0003], lines 11-14.

***Allowable Subject Matter***

4. Claims 21, 23-25 and 31-32 are allowed.

***Response to Arguments***

5. Applicant's arguments filed April 19, 2011 have been considered, but are moot in view of the new grounds of rejection as necessitated by the amendment to the claims, and using the prior art of record. Examiner maintains that the APA and prior art of record do not teach away from the limitation of the claims, and can be combined as disclosed in the prosecution of the claims.

***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Andrews whose telephone number is (571) 270-1801. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rao S. Seema can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin C. Harper/

Primary Examiner, Art Unit 2462

/Leon Andrews/  
Examiner, Art Unit 2462  
May 2, 2011